

CLAIMS:

1. A system, comprising:
a plurality of radio frequency (RF) antennas set up to provide one or more interrogation corridors; and
a RF reader coupled to the plurality of antennas, the RF reader having a transmitter/receiver (T/R) port that provides each of the antennas with RF power to produce interrogation fields within the interrogation corridors.
2. The system of claim 1, further comprising a splitter that receives the RF power from the RF reader and delivers the RF power to each of the plurality of antennas in the form of a plurality of antenna drive signals.
3. The system of claim 2, wherein the splitter receives one or more input signals from the plurality of antennas and combines the one or more tag signals to form a combined input signal for delivery to the T/R port of the RF reader.
4. The system of claim 3, wherein the plurality of antennas generate the input signals in response to at least one tag present within the interrogation fields.
5. The system of claim 1 wherein the splitter combines the input signals such that a weak input signal from one of the antennas is combined with a weak input signal from at least one other antenna to increase the likelihood of detecting a tag in the corridor.
6. The system of claim 1, wherein the interrogation corridors are located near the exit of a protected area.
7. The system of claim 1, wherein the reader generates a tag detection signal to indicate that at least one tag is present within the interrogation corridors.

8. The system of claim 7, further comprising a controller that receives the tag detection signal and output an alarm signal to produce an alarm.
9. The system of claim 8, further comprising a plurality of sensors to detect a patron within any of the interrogation corridors and generate a patron signal,
wherein the controller outputs an alarm signal upon receiving the tag detection signal and the patron signal within a time period.
10. The system of claim 9, wherein the controller initiates a timer upon receiving either of the tag detection signal or the patron signal, and outputs the alarm signal upon receiving the other one of the tag detection signal or the patron signal prior to expiration of the timer.
11. The system of claim 1 wherein each antenna receives RF power from the reader that is out of phase with its neighboring antennas to produce rotating interrogation fields within the interrogation corridor.
12. The system of claim 11, wherein the RF power delivered to each of the antennas has a 90° phase difference from the RF power delivered to a neighboring one of the antennas.
13. The system of claim 12, wherein the 90° phase difference is provided using $\frac{1}{4}$ wavelength transmission lines.
14. The system of claim 1 wherein the T/R port that simultaneously provides each of the antennas with the RF power and accepts a signal produced by an RF tag in any of the interrogation corridors.

15. A method, comprising:
 - producing a radio frequency (RF) output signal from a single transmitter/receiver (T/R) port of an RF reader;
 - splitting the RF output signal into a plurality of antenna drive signals; and
 - delivering the antenna drive signals to a plurality of antennas to produce interrogation fields within one or more interrogation corridors.
16. The method of claim 15, further comprising:
 - generating one or more input signals with the antennas in response to at least one tag present within the interrogation fields;
 - combining the input signals into a combined input signal; and
 - providing the combined input signal to the T/R port of the RF reader.
17. The method of claim 16, further comprising:
 - receiving the combined input signal with the T/R port; and
 - generating a tag detection signal from the combined input signal to indicate that at least one tag is present within the interrogation corridors
18. The method of claim 16, further comprising:
 - outputting the tag detection signal from the RF reader to a controller; and
 - outputting an alarm signal from the controller in response to the tag detection signal.
19. The method of claim 18, further comprising:
 - receiving a patron signal that indicates whether a patron is present within any of the interrogation corridors; and
 - outputting the alarm signal upon receiving the tag detection signal and the patron signal within a time period.

20. The method of claim 19, further comprising:
initiating a timer upon receiving either of the tag detection signal or the patron signal;
and
outputting the alarm signal upon receiving the other one of the tag detection signal or the patron signal prior to expiration of the timer.
21. The method of claim 17, further comprising producing rotating interrogating fields in the interrogation corridor.
22. The method of claim 15, further comprising delivering the plurality of antenna drive signals to the plurality of antennas such that adjacent antennas are driven out of phase.
23. The method of claim 15, further comprising delivering the plurality of antenna drive signals to the plurality of antennas such that adjacent antennas are driven 90° out of phase.
24. The method of claim 23, wherein delivering the plurality of antenna drive signals comprises delivering the signals using $\frac{1}{4}$ wavelength transmission lines.
25. An exit control system for detecting unauthorized removal of articles from a protected area, the exit control system comprising:
a plurality of antennas oriented to provide interrogation corridors; and
an RF reader that provides RF power to the antennas to produce interrogation fields in the interrogation corridors, wherein the RF reader interrogates the plurality of antennas using a single port to transmit RF power to the antennas and to receive tag signals from the antennas at the single port.

26. A computer-readable medium comprising instructions that cause a processor to:
- receive from a single reader a tag detection signal that indicates at least one tag is present within any of a plurality of interrogation corridors;
 - receive a patron signal that indicates at least one patron is present within any of the interrogation corridors; and
 - output an alarm signal upon receiving the tag detection signal and the patron signal within a time period.
27. The computer-readable medium of claim 26, further comprising instructions to cause the processor to:
- initiate a timer upon receiving either of the tag detection signal or the patron signal;
 - and
 - output the alarm signal upon receiving the other one of the tag detection signal or the patron signal prior to expiration of the timer.